AMENDMENT & RESPONSE UNDER 37 C.F.R. § 1.116 - EXPEDITED PROCEDURE   Page 2
Serial Number: 09/210,055   Dkt: 884.055US1
Filing Date: December 11, 1998
Title: METHOD AND APPARATUS FOR CONTROLLING IMAGE TRANSPARENCY

Claims 21, 23, 25, 27, 29-31, 33, and 35-36 stand rejected, and the rejection is appealed herein.

4. STATUS OF AMENDMENTS

No amendments have been made subsequent to those requested in the response to the Office Action mailed to the Appellants on May 21, 2002.

5. SUMMARY OF THE INVENTION

As described in the Appellant's specification at page 1, line 22 - page 7, line 10, and shown generally in figures 1-2, embodiments of the invention relate to a variety of methods and apparatus for controlling image transparency. Some embodiments relate to modulating, or controlling the transparency over a range, from opaque to clear. (Application, pg. 2, lines 23-25). Transparency may be controlled by modulating a transparency factor, which in some embodiments may range from zero (e.g., clear) to one (e.g., opaque). (Application, pg. 3, lines 3-6). A complex object, such as a sphere, may be associated with a large number of transparency factors. (Application, pg. 3, lines 8-10).

In some embodiments, the transparency factor may be associated with the angle of incidence formed by the intersection of the viewing surface normal vector and the object surface normal vector. (Application, pg. 3, lines 11-13). Various functions, such as the cosine function, may operate on the angle of incidence to generate and/or modulate the transparency factor. (Application, pg. 3, lines 20-25). In addition to the embodiments just described, the invention includes other embodiments of varying scope, including systems and methods. (Application, Pg. 4, line 4 - pg. 7, line 10).

6. ISSUES PRESENTED FOR REVIEW

Whether claims 21, 23, 25, 27, 29-31, 33, and 35-36 were properly rejected under 35 USC § 102(e) as being anticipated by Shinohara (U.S. Patent No. 5,880,735, hereinafter "Shinohara")?

7. GROUPING OF CLAIMS

All claims are to be taken independent of each other and each stands alone for purposes

of this appeal.

8. ARGUMENT

a) The Applicable Law

Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *In re Dillon* 919 F.2d 688, 16 USPQ 2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991). It is not enough, however, that the prior art reference discloses all the claimed elements in isolation. Rather, "[a]nticipation requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*" *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added). "The *identical invention* must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP § 2131 (emphasis added).

b) The References

Shinohara: teaches a method and apparatus for transparency conversion by changing the transparency at polygons based upon the Z component of the unit normal vector at each vertex. See Col. 11, lines 37-43. The normal vector of each vertex is found by taking the average of each normal vector of the polygons adjoining the vertex. Col. 2, lines 2-4. The transparency of each pixel on a surface is then adjusted to reflect the transparency of the vertices which enclose the surface. Col. 10, lines 33-49.

c) Discussion of the Rejections

c.1 The Rejection Under § 102:

Claims 21, 23, 25, 27, 29-31, 33, and 35-36 have been rejected under 35 USC § 102(e) as being anticipated by Shinohara. The Appellant does not admit that Shinohara is prior art, and reserves the right to swear behind this reference in the future. In addition, the MPEP requires

that "[t]he identical invention must be shown in as complete detail as is contained in the ...

claim." *See* M.P.E.P. § 2131. Because the Appellant asserts that the Office has not shown that

Shinohara discloses the identical invention as claimed, the Appellant respectfully traverses this

rejection of the claims.

c.1.1. Why the reference does not disclose each and every element of the claimed subject matter as arranged in the claims.

In Shinohara, the normal vector of a *vertex* is found by taking the average of each normal

vector of the polygons adjoining the vertex. See Shinohara, Col. 2, lines 2-37, and vectors at

vertices "a", "b", etc. in FIG. 8. Thus, Shinohara does not disclose the element of " ... an angle

of incidence at the object *surface* modulating the transparency of an image ..." as shown in the

Application (e.g., FIG. 1, elements 140, 220, and 380), and claimed by the Appellant in

independent claims 21, 25, 29, and 35 (from which claims 23, 27, 30-31, 33, and 36 depend).

While asserting the existence of such an element in the Office Action (see Office

Action,"Claim Rejections - 35 USC § 102", pg. 4, where reference is made to "... identifying a

vector normal to a viewing surface ... the vector creating an angle of incidence at the object

surface; and modulating the transparency of an image of the object as a function of the angle of

incidence at the object surface", it should be noted that Shinohara explicitly states that

transparency changes are made using *vertex* normal vectors, not *surface* normal vectors, as

claimed by the Appellant. To quote Shinohara, with respect to the transparency of pixels on a

surface, "... as the transparency of each pixel enclosed by those vertices is complemented by the

transparency of the vertices, the various transparency can be provided [sic] to each pixel in one

surface." Shinohara, Col. 10, lines 47-50. Since the Appellant believes that no "angle of

incidence at the object surface" is taught within the bounds of Shinohara, claims 21, 25, 29, and

35 (as well as dependent claims 23, 27, 30-31, 33, and 36) should be allowable over this

reference.

c.1.2. Why the reference does not disclose the claimed subject matter in as complete detail as is contained in the claim.

Shinohara takes a two-step approach to transparency conversion. First, the transparency

of each vertex of a polygon is corrected using a correction factor P applied to the Z component of

a *vertex* normal unit vector. Thus, the asserted disclosure of an "angle of incidence" (at Col. 8, lines 10-29; Col. 9, lines 10-35; and Col. 10 - Col. 11, lines 10 in the Office Action) actually refers to a discussion by Shinohara concerning the correction factor "P", and not to a normal unit vector at a polygon surface. Second, the transparency of each pixel in a surface is then determined using the corrected transparency of the enclosing vertices. See Shinohara, Col. 3, line 55 - Col. 4, line 15. This approach is strikingly different than that taken by the Appellant. The difference is emphasized in Shinohara's own words "... the transparency of each pixel is complemented by the transparency of each vertex. ... the transparency of each pixel may become different from each other." Shinohara, Col. 10, lines 36-39. Embodiments of the Appellant's invention adjust transparency directly - using the angle of incidence between a vector normal to the viewing surface and the surface of the object. Application, pg. 1, lines 22-25.

Several assertions in the Office Action are made with respect to various concepts allegedly disclosed by Shinohara. However, a careful reading of each citation reveals that the assertions do not correctly state the meaning of Shinohara. These assertions, and their factual corrections, are as follows:

Claim 21: Assertion: Shinohara teaches ... modulating (... element program executes corresponds to modulating because a computer program consisting of modules) the transparency ... . Fact: Shinohara only discloses transparency correction based on vertex normal vectors. The existence of software program modules does not affect the activity of "modulating", specifically defined by the Appellant as "varying the transparency over a range." See Application, page 2, lines 24-25.

Claims 23, 27, 33, and 36: Assertion: Shinohara discloses a linear function. Fact: Shinohara only discloses transparency correction based on *vertex* normal vectors. Thus, it is impossible for Shinohara to teach the use of a linear function as applied to a *surface* incidence angle.

Claims 30-31: Assertion: Shinohara discloses a storage device comprising a memory ... Shinohara teaches a frame buffer. Fact: Shinohara indeed does disclose the existence of a frame buffer. However, the Appellant claims "a computer-readable medium" from which a computer program can be executed. A frame buffer is used as a repository for raw image data, and not for program execution. The Appellant's representative was unable to find any instance where Shinohara teaches program execution from instructions stored in the frame buffer element 14.

Therefore, since Shinohara does not disclose " ... an angle of incidence at the *object surface* modulating the transparency of an image ..." as claimed by the Appellant, reconsideration and withdrawal of the rejection under § 102 is respectfully requested.

c.2 Why The Claims Are Separately Patentable:

While the separate patentability of each claim has been discussed in the "Argument" section above, as allowed in the M.P.E.P. § 1206, the reasons are summarized here to ensure completeness and as a matter of convenience for the Board.

Independent claim 21 recites a method including "modulating the transparency of an image of the object as a function of the angle of incidence of the vector at the object surface." Shinohara does not disclose this element, especially respecting *a vector at the object surface*.

To the elements of independent claim 21, dependent claim 23 adds a linear modulating function. Shinohara does not disclose this element, especially respecting *an angle of incidence of the vector at the object surface* and no other claim has this unique combination of elements.

Independent claim 25 recites a method for generating a transparency factor including "selecting a viewing surface; selecting a vector normal to the viewing surface; [and] determining an angle of incidence at the object surface." Shinohara does not disclose this element, especially respecting *an angle of incidence at the object surface*.

To the elements of independent claim 25, dependent claim 27 adds "calculating a linear function of the angle of incidence." Shinohara does not disclose this element, especially respecting *an angle of incidence at the object surface* and no other claim has this unique combination of elements.

Independent claim 29 is directed to a computer having "a computer program capable of being executed from [a] computer-readable medium ... to modulate the transparency of an image of an object as a function of an angle of incidence of a vector at a surface of the object." Shinohara does not disclose this element, especially respecting *an angle of incidence of a vector at a surface of the object*.

To the elements of independent claim 29, dependent claim 30 adds "the computer-readable medium comprises a storage device." Shinohara does not disclose this element, especially respecting *an angle of incidence of a vector at a surface of the object* and *a medium*

for execution, no other claim has this unique combination of elements. To this dependent claim claim 30, dependent claim 31 further adds "the storage device comprises a memory." Shinohara does not disclose this element, especially respecting *an angle of incidence of a vector at a surface of the object* and *a medium for execution*, no other claim has this unique combination of elements.

To dependent claim claim 30, dependent claim 33 further adds a linear modulating function. Shinohara does not disclose this element, especially respecting *an angle of incidence of a vector at a surface of the object* and *a medium for execution*, no other claim has this unique combination of elements.

Independent claim 35 is directed to a computer readable medium having computer-executable instructions stored thereon for performing a method including "modulating the transparency of an image of an object as a function of the angle of incidence of a vector at the surface of the object." Shinohara does not disclose this element, especially respecting *an angle of incidence of a vector at a surface of the object.*

To the elements of independent claim 35, dependent claim 36 adds "modulating the transparency linearly." Shinohara does not disclose this element, especially respecting *an angle of incidence at the object surface* and no other claim has this unique combination of elements.

9. SUMMARY

It is respectfully submitted that a case of anticipation under 35 U.S.C. §102 has not been established. Therefore, it is respectfully requested that the rejections of claims 21, 23, 25, 27, 29-31, 33, and 35-36 be reconsidered and withdrawn so that the claims will be in condition for allowance. The Examiner is invited to telephone Appellants' attorney, Mark Muller, at (210) 308-5677, or the undersigned attorney, to facilitate prosecution of this application. Should the Board be of the opinion that any rejected claim is allowable in amended form, an explicit statement to that effect is also respectfully requested. If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

AMENDMENT & RESPONSE UNDER 37 C.F.R. § 1.116 - EXPEDITED PROCEDURE
Serial Number: 09/210,055
Filing Date: December 11, 1998

Page 8
Dkt: 884.055US1

Title: METHOD AND APPARATUS FOR CONTROLLING IMAGE TRANSPARENCY

Respectfully submitted,

JOHN DAVID MILLER

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 371-2109

Date _December 20, 2002_   By _Danny Padys_

Danny J. Padys
Reg. No. 35,635